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Editorial

Health & ageing in international context

The world's population is ageing. Around the globe, the proportion of the population aged >60 will rise from 10 per cent in 2005 to 22 per cent by mid-century[1]. Presently, people >85 yr comprise the fastest growing age group, and a lifespan of 100 years for women will become commonplace in the developed world[2]. However, the bulk of the increase is occurring in developing countries, where general declines in mortality rates largely achieved are being met by dropping fertility rates in regions undergoing demographic and epidemiologic transition. While within India these transitions are in different stages and occurring at different rates[3], the population aged 60 or over will triple from an estimated 96 million in 2011 to over 316 million by mid-century, comprising about 20 per cent of the population; in the same period, India's 80-plus population will quintuple[4].

It is thus fitting that the theme of World Health Day this April 7 is "Ageing and Health", both as a reminder of what has been achieved, and what is left to do. Population ageing is the consequence of improved living standards and medical and public health successes such as control of communicable diseases and improvements in child and maternal health. Although the WHO notes, "population aging is transforming societies, domestic living arrangements, care and support of older family members, the training of healthcare providers, and the delivery and social and health services[5]", yet, even in relatively wealthy, fully industrialized Western countries wherein population transitions have been long unfolding and are complete, it can hardly be said that these issues have been worked through. With respect to medical training and care in the U.S., there is still inadequate attention to development of a professional workforce competent in geriatric care[6], and much of the healthcare system remains ill adapted to the needs of older patients[7-9]. More alarming, however, is the acceleration of population transition in the developing world - including South Asia - meaning that these countries have much less time to achieve the transformations of social, economic and health systems necessary to maintain the health and quality of life of older people[5,10]. The global challenge is being addressed by the WHO's Integrated Response of Health Care Systems to Rapid Population Ageing [INTRA] Programme[6], and in India by the National Rural Health Mission and the National Programme for the Health Care of the Elderly[11]. These efforts alone will likely be insufficient. Urgently needed is a programme of knowledge transfer for geriatric care to match the rising needs[12].

While health and well-being of elderly people depends upon broader social and economic support and development, geriatric medical research is making firm contributions to the base of practical knowledge available to support needed reforms. As non-communicable diseases become a greater part of the total chronic disease burden of older patients, geriatric assessment and management principles-sometimes implemented by multi-professional practice teams - are improving care processes and outcomes of older patients whose multidimensional health status, medication and treatment tolerance, competing risks, and care preferences must be accounted for to determine appropriate treatment. Gero-orthopaedic co-management of acute hip fracture is one area of such progress[13]. In a related vein, there is evidence that post-repair comprehensive geriatric assessment and targeted multi-component treatment emphasizing high-intensity resistance training substantially reduces

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one-year mortality and nursing-home placement while decreasing disability in older hip-fracture patients - some of whom are "frail"[14]. Geriatricians have come to understand frailty as "a state of high vulnerability for adverse health outcomes, including disability, dependency, falls, need for long-term care, and mortality…theorized to result from age- and/or disease-associated physiologic accumulation of sub-threshold decrements affecting multiple physiologic systems, and detectable by looking at clinical, functional, behavioral and biological markers[15]." In the aforementioned strength-training trial in older hip-fracture patients, targeted interventions included gait/balance training, osteoporosis, nutrition, vitamin D/calcium, depression, cognition, vision, home safety, polypharmacy, hip protectors, self-efficacy and social support. It was shown that these interventions were associated with observed improvement in disability measures[14]. The implication is that efforts to address frailty risk in older hip fracture patients after hospital discharge and "standard" rehabilitation can be highly efficacious.

Such demonstrations of clinical progress help reverse the historical tendency in medicine - as in society - to use adjectives like "frail", "disabled", "impaired", "chronically, co-morbidly ill", and "old" interchangeably and sometimes pejoratively. In fact, they underscore the need to clarify the concepts of and linkages between co-morbidity, disability, frailty and other geriatric syndromes[15,16]. Co-morbidity - not exclusive to but highly relevant in many elderly patients has been traditionally defined as the co-existence in the same patient of two or more diagnosed diseases[15]. However, research attention to multiple co-occurring conditions, *versus* the usual regard for a single diagnosis as primary and add-on conditions as effect modifiers, reveals their relationships with incident disability and emergent system impairments and geriatrics syndromes[17,18]. Epidemiologically, some diseases or conditions have greater or lesser likelihoods of co-occurrence, and may be synergistic in their effects. For the development of mobility disability, it has been observed that the risks posed by heart disease alone (Odds ratio = 2.3), and by osteoarthritis alone (OR=4.3), are considerably less than by the combination (OR = 13.6)[19]. Are convergent mechanisms responsible for this, and how, more precisely? Does heart disease lead to mobility disability through loss of exercise tolerance, and osteoarthritis through pain, disuse, muscle weakness, and loss of exercise tolerance?

As in the frailty phenotype, the classification and development of research on other geriatric syndromes (such as falls, delirium, and incontinence) is being addressed to good practical effect[20-22]. These syndromes are conceptualized as "multifactorial health conditions that occur when the accumulated effects of impairments in multiple systems render [an older] person vulnerable to situational challenges[16]". Their casting as phenotypes (observable characteristics of an individual determined by the genotype and environment) lends to them a cautious, rigorous, incremental approach to definition. Ongoing work is elucidating the multiple aetiological factors and interacting pathogenetic pathways associated with particular phenotypes or outcomes such as incontinence, delirium or falls, among others.

Geriatrics addresses health complexities outside of biological processes, by weighing the effects of social, psychological, and environmental factors on the manifestations in older patients of multiple morbidity, system impairments, geriatric syndromes, and disabilities. This brings us full circle to the social, economic, formal and informal sources of health and well-being of older populations. As elsewhere, the development of geriatrics and geriatric systems of care in India will benefit from the expeditious adoption of established geriatric assessment technologies[23], and related research, practice and training paradigms[6]. However, this development must be fully accommodated to the greatly diverse cultures, values and resources of the country. Both will be needed if the promise of "Ageing and Health" will be kept.

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References

1. Lutz W, Sanderson W, Scherbov S. The coming acceleration of global population ageing. *Nature* 2008; *451* : 716-19.
2. Oeppen J, Vaupel JW. Broken limits to life expectancy. *Science* 2002; *296* : 1029-31.
3. James KS. India's demographic change: Opportunities and challenges. *Science* 2011; *333* : 576-80.
4. Bloom DE. India's baby boomers: Dividend or disaster? *Current History* 2011; *110* : 143-9.
5. World Health Organization. Geneva: United Nations. World Health Day - 7 April. Available from: *http://www.who.int/world-health-day/en/*, accessed on February 6, 2012.
6. Institute of Medicine Committee on the Future of Health Care Workforce for Older Americans. *Retooling for an aging*

America: Building the health care workforce. Washington, DC: The National Academies Press; 2008.

7. Boult C, Wieland D. Comprehensive primary care for older patients with multiple chronic conditions: "Nobody rushes you through". *JAMA* 2010; *304* : 1936-43.
8. Covinsky KE, Pierluissi E, Johnston CB. Hospital-associated disability: "She was probably able to ambulate, but I'm not sure". *JAMA* 2011; *306* : 1782-93.
9. Kane RL. Finding the right level of post-hospital care: "We didn't realize there was any other option for him". *JAMA* 2011; *305* : 284-93.
10. Chatterji S, Kowal P, Mathers C, Naidoo, N, Verdes E, Smith JP, *et al*. The health of aging populations in China and India. *Health Affairs* 2008; *27* : 1052-63.
11. Directorate General of Health Services. *National Programme for the Health Care of the Elderly (NPHCE): An approach towards Active and healthy ageing - Operational guidelines.* New Delhi: Ministry of Health & Family Welfare, Government of India; 2011. Available from: *http://www.jkhealth.org/notifications/bal456.pdf*, accessed on February 6, 2012.
12. Evans JM, Kiran PR, Bhattacharyya OK. Activating the knowledge-to-action cycle for geriatric care in India. *Health Res Policy Syst* 2011; *9* : 42.
13. Friedman SM, Mendelson DA, Kates SL. Hip fractures. In: Hirth VA, Wieland D, Dever-Bumba M, editors. *Case-Based Geriatrics*. New York: McGraw Hill; 2011. p. 529-43.
14. Singh NA, Quine S, Clemson LM, Wiliiams EJ, Wiliamson DA, Stavrinos TM, *et al*. Effects of high-intensity progressive resistance training and targeted multidisciplinary treatment of frailty on mortality and nursing-home admissions after hip fracture: A randomized controlled trial. *JAMDA* 2012; *13* : 11-23.
15. Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G. Untangling the concepts of disability, frailty, and comorbidity: Implications for improved targeting and care. *J Gerontol A Med Sci* 2004; *59* : 255-63.
16. Inouye SK, Studenski S, Tinetti ME, Kuchel GA. Geriatric syndromes: clinical, research, and policy implications of a core geriatric concept. *J Am Geriatr Soc* 2007; 55 : 780-91.
17. Boyd CM, Ritchie CS, Tipton EF, Studenski SA, Wieland D. From bedside to bench: Summary from the American Geriatrics Society/National Institute on Aging Research Conference on Comorbidity and Multiple Morbidity in Older Adults. *Aging Clin Exper Res* 2008; *20* : 181-8.
18. Yancik R, Ershler W, Satariano W, Hazzard W, Cohen HJ, Ferrucci L. Report of the National Institute on Aging task force on comorbidity. *J Gerontol A Med Sci* 2007; *62* : 275-80.
19. Ettinger WH, Davis MA, Neuhaus JM, Mallon KP. Long-term physical functioning in persons with knee osteoarthritis from NHANES. I: Effects of comorbid medical conditions. *J Clin Epidemiol* 1994; *47* : 809-15.
20. Tinetti ME, Kumar C. The patient who falls: "It's always a trade-off". *JAMA* 2010; *303* : 258-66.
21. Inouye SK. Delirium in older persons. *N Engl J Med* 2006; *354* : 1157-65.
22. Goode PS, Burgio KL, Richter HE, Markland AD. Incontinence in older women. *JAMA* 2010; *303* : 2172-81.
23. Wieland D, Ferrucci L. Multidimensional geriatric assessment: Back to the future [editorial]. *J Gerontol A Med Sci* 2008; *63* : 272-4.